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GOPAL GOVIND POY RAITURCAR COLLEGE OF COMMERCE AND ECONOMICS, PONDA-GOA

B.C.A (SEMESTER-I) SUPPLEMENTARY EXAMINATION

MAY/JUNE 2019

BCA 104 BASIC MATHEMATICS

Duration : 2 hours Marks: 50

Instructions: (1) Attempt all the questions.
(2) Figures to right indicate full marks.

Q1. Answer the following questions. (10x1=10)

a) Area of circle with radius 10cm is _____ cm^2.

b) $\int_0^1 e^x \ dx$is _____.

c) If a line passes through (2,0) and (0,-4) then its equation is _____.

d) The sum of first n terms of an A.P. is _____.

e) If $B = [3 \quad 4 \quad 5]$ then the order of matrix is _____.

f) For a G.P. $9, \frac{9}{2}, \frac{9}{4}, \frac{9}{8}$ the value of a and r is _____ and _____.

g) If $y = x^4 - 2$ then $y' =$ _____.

h) $\lim_{x\to 0} \frac{sinx}{x}$= _____.

i) The *gcd* of 28 and 120 is _____.

j) If $z = -1 + i$ then $\bar{z} =$ _____.

Q2.

a) Check whether the vector $\vec{a} = \hat{\imath} + \hat{\jmath} - 3\hat{k}\ and\ \vec{b} = 7\hat{\imath} - 4\hat{\jmath} + \hat{k}$ are perpendicular. (2)

b) The diameter of cylinder is 0.4m and height is 10cm. Find its curved surface area, total surface area and volume. (3)

c) Let x and y be two numbers in the ratio 1:2. If 6 was added to both the numbers x and y then the ratio becomes 3:4. Find the two numbers. (5)

OR

d) Find the angle between two vectors$a = \hat{\imath} - 2\hat{\jmath} + \hat{k}$and $b = 2\hat{\imath} + \hat{\jmath} - 3\hat{k}$. (2)

e) The diameter of a cone is 10m and its slant height is 13m.Find its volume. (3)

f) The sum of three numbers is 98. If the ratio of the first to second is 2:3 and that of the second to the third is 5:8, then find the three numbers. (5)

Q3.

a) Find the area of a parallelogram whose adjacent sides are$3\hat{\imath} + 4\hat{\jmath} - \hat{k}$ and $4\hat{\imath} - 2\hat{\jmath} + 5\hat{k}$ (3)

b) Use De Moivre's theorem to prove that $sin2\theta = 2sin\theta cos\theta$. (2)

c) If $= \begin{bmatrix} 5 & 7 \\ 4 & -1 \end{bmatrix}$, find $4A^2 + 3A - 2I$. (5)

OR

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d) Find the area of a triangle whose sides are $2\hat{\imath} + 4\hat{\jmath} - \hat{k}$ and $-\hat{\imath} + \hat{\jmath} - 3\hat{k}$ (3)

e) Let $z = 2 + 3i$, verify $z\bar{z} = |z|^2$. (2)

f) Solve the following system of equations by using Cramer's Rule. (5)

$$2x - 4y + 3z = 4, \quad x + y + z = 2, \quad 3x + y - z = 2$$

Q4.

a) Let z_1= -1 + 3i and z_2= 2 + 3i. Verify$z_1 z_2 = z_2 z_1$. (2)

b) Find the three numbers in G.P. whose sum is 35 and product is 1000. (3)

c) Check whether (-1, 3), (2, 5) and (6,-1) are the vertices of a right angled triangle. (5)

OR

d) Find cube roots of unity. (2)

e) Find the three numbers in A.P. whose sum is 33 and product is 1320. (3)

f) Find the equation of line through (7,-3) and parallel to the line through (-1,2) and (5,11). (5)

OR

Q5.

a) Let $f(x) = x^2 + 2$ and $g(x) = logx$. Find $(f \bullet g)(x)$. (2)

b) Let $f(x) = \frac{x^2-8x+16}{x^2-16}$, find $\lim_{x\to 4} f(x)$. (2)

c) Evaluate $\int_0^1 x^2 + e^x + \frac{1}{x^2}\, dx$. (3)

d) Show that yy''- y'cos x + 1 = 0 if y = sin x. (3)

OR

e) Check whether $f(x) = \begin{cases} \frac{sin\,2x}{x}, & x \neq 0 \\ 1, & x = 0 \end{cases}$ is continuous at x=0. (2)

f) Find $\lim_{x\to 3} \frac{x^3-27}{x-3}$ (2)

g) Evaluate $\int_0^2 (x^2 - 2^x) dx$. (3)

h) Examine the function $f(x) = 2x^2 - 5x$ for maxima or minima. (3)

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